Supplementary material

Supplementary Table 1 Summary of search strategies and results

Database	Search Query	Results
Pubmed	((Ecervix[Title/Abstract]) OR (E-cervix[Title/Abstract])) AND (("Premature Birth"[Mesh]) OR (Birth, Premature[Title/Abstract] OR Births, Premature[Title/Abstract] OR Premature Births[Title/Abstract] OR Preterm Birth[Title/Abstract] OR Birth, Preterm[Title/Abstract] OR Births, Preterm[Title/Abstract] OR Preterm Births[Title/Abstract]))	9
WOS	(TS=(Ecervix) OR TS=(E-cervix)) NOT (SILOID==("PPRN"))	56
	(TS=(Premature Birth) OR TS=(Birth, Premature) OR TS=(Births, Premature) OR TS=(Premature Births) OR TS=(Preterm Birth) OR TS=(Birth, Preterm) OR TS=(Births, Preterm) OR TS=(Preterm Births)) NOT (SILOID==("PPRN"))	155446
	#2 AND #1 and Preprint Citation Index (Exclude – Database)	16
Cochrane	#1 MeSH descriptor: [Premature Birth] explode all trees	2579
	#2 (Birth, Premature):ti,ab,kw OR (Births, Premature):ti,ab,kw OR (Preterm Births):ti,ab,kw OR (Births, Preterm):ti,ab,kw OR (Preterm Birth):ti,ab,kw	13508
	#3(Birth, Preterm):ti,ab,kw OR (Premature Births):ti,ab,kw	10559

	#4 #1 OR #2 OR #3	13508
	#5 (Ecervix):ti,ab,kw OR (E-cervix):ti,ab,kw	3
	#6 #4 AND #5	0
embase	#1 'prematurity'/exp	163345
	CancelTest	
	#2 'prematurity'/exp OR prematurity OR 'birth premature':ab,ti OR 'infant, premature':ab,ti OR 'infant, premature, diseases':ab,ti OR 'neonate, premature':ab,ti OR 'pre-mature birth':ab,ti OR 'pre-mature infant':ab,ti OR 'pre maturity':ab,ti OR 'pre-term babies':ab,ti OR 'pre-term baby':ab,ti OR 'pre-term birth':ab,ti OR 'pre-term child':ab,ti OR 'pre-term infant':ab,ti OR 'pre-term infants':ab,ti OR 'pre-term neonate':ab,ti OR 'pre-term neonates':ab,ti OR 'pre-term newborn':ab,ti OR 'pre-term newborns':ab,ti OR premature:ab,ti OR 'premature babies':ab,ti OR 'premature baby':ab,ti OR 'premature birth':ab,ti OR 'premature child':ab,ti OR 'premature childbirth':ab,ti OR 'premature infant':ab,ti OR 'premature infant disease':ab,ti OR 'premature infant diseases':ab,ti OR 'premature infants':ab,ti OR 'premature neonate':ab,ti OR 'premature neonates':ab,ti OR 'premature newborn':ab,ti OR 'premature newborns':ab,ti OR 'premature syndrome':ab,ti OR prematuritas:ab,ti OR prematurities:ab,ti OR 'preterm babies':ab,ti OR	369115

	'preterm baby':ab,ti OR 'preterm birth':ab,ti OR 'preterm child':ab,ti OR 'preterm infant':ab,ti OR 'preterm infants':ab,ti OR 'preterm neonate':ab,ti OR 'preterm neonates':ab,ti OR 'preterm newborn':ab,ti OR 'preterm newborns':ab,ti	
	#3 ecervix OR 'e cervix':ab,ti	40
	#4 #2 AND #3	15
Wanfang Data	(Chinese-English Expansion & Thesaurus Expansion): Title or Keywords: (preterm birth) AND Title or Keywords: (E-cervix) OR Title or Keywords: (Ecervix)	12

China National Knowledge Infrastructure (CNKI)	(Subject: preterm birth) OR (Title/Keywords/Abstract: preterm infant + early preterm birth + abortion and preterm birth + spontaneous preterm birth + maternal preterm birth + spontaneous preterm birth + preterm birth with premature rupture of membranes + prevention of preterm birth (exact)) AND (Subject: Ecervix) OR (Title/Keywords/Abstract: E-cervix (exact))	17

Supplementary Table 2 Summary of meta-regression analysis for the diagnostic accuracy for E-Cervix Parameters and Conventional Measurement Parameters

Parameters	Variable	Coefficient	Std Err	RDOR (95% CI)	*P*(Meta-reg)
CL					
	Pregnancy status	-0.22	0.51	0.8(0.24-2.66)	0.68
	Gestational age	-0.34	0.55	0.71(0.19-2.63)	0.56
	Risk stratification	-0.42	0.77	0.66(0.11-4.11)	0.61
	Study design	-0.27	0.70	0.76(0.14-4.04)	0.71
	Sample size	0.88	0.67	2.4(0.49-11.74)	0.23
ACA					
	Pregnancy status	-0.20	0.94	0.82(0.00-120815.87)	0.87
	Gestational age	-0.65	2.41	0.52(0.00-1000116.82)	0.83
	Risk stratification	0.04	0.70	1.04(0.00-7935.80)	0.97
	Study design	0.20	0.94	1.22(0.00-179280.78)	0.87
	Sample size	-0.27	1.20	0.76(0.00-3006242.07)	0.86
ECI					

	Pregnancy status	-0.65	0.25	0.52(0.28-0.96)	0.06
	Gestational age	-0.80	0.75	0.45(0.07-2.80)	0.32
	Risk stratification	-0.34	0.69	0.71(0.13-3.81)	0.64
	Study design	0.62	0.89	1.86(0.21-16.34)	0.51
	Sample size	-0.58	0.69	0.56(0.10-3.02)	0.43
IOS					
	Pregnancy status	0.08	0.27	1.09(0.54-2.17)	0.77
	Gestational age	0.56	0.51	1.75(0.50-6.10)	0.31
	Risk stratification	-0.06	0.47	0.94(0.28-3.19)	0.91
	Study design	0.06	0.47	1.06(0.31-3.59)	0.91
	Sample size	0.46	0.41	1.59(0.56-4.51)	0.31
EOS					
	Pregnancy status	-0.28	0.19	0.75(0.46-1.23)	0.20
	Gestational age	-0.17	0.56	0.84(0.20-3.51)	0.77
	Risk stratification	-0.10	0.39	0.91(0.33-2.48)	0.81
	Study design	0.10	0.39	1.10(0.40-3.02)	0.81

	Sample size	0.35	0.40	1.42(0.50-4.01)	0.42
IOS/EOS					
	Pregnancy status	-1.13	0.86	0.32(0.02-5.07)	0.28
	Gestational age	-0.94	0.79	0.39(0.03-4.82)	0.32
	Risk stratification	-0.81	0.81	0.44(0.03-5.87)	0.39
	Study design	2.31	1.38	10.08(0.12-818.99)	0.19
	Sample size	0.52	0.89	1.69(0.10-28.43)	0.60
HR					
	Pregnancy status	-0.01	0.41	0.99(0.38-2.55)	0.98
	Gestational age	0.21	0.26	1.23(0.67-2.26)	0.46
	Risk stratification	0.03	0.38	1.03(0.43-2.47)	0.93
	Study design	-0.05	0.42	0.95(0.36-2.48)	0.90
	Sample size	-0.36	0.35	0.70(0.31-1.55)	0.33
Combined					
	Pregnancy status	-1.82	0.55	0.16(0.03-0.75)	0.03
	Gestational age	-1.92	0.80	0.15(0.02-1.35)	0.07

Risk stratification	-1.50	1.50	0.22(0.00-14.37)	0.37
Study design	2.72	1.03	15.23(0.88-265.17)	0.06
Sample size	-2.65	1.64	0.07(0.00-6.64)	0.18

Supplementary Table 3 Meta regression and subgroup analyses of sensitivity and specificity for E-Cervix Parameters and Conventional Measurement Parameters

Parameters	Subgroup Factors	No. Studies	Pooled Sen (95%CI)	*P*	Pooled Spe (95%CI)	*P*
CL						
	Study design					
	Retrospective	6	0.61(0.40,0.83)	0.64	0.68(0.58,0.79)	0.20
	Prospective	4	0.67(0.41,0.92)		0.70(0.57,0.82)	
	Pregnancy status	10	0.65(0.35,0.87)	0.93	0.65(0.48,0.79)	0.69
	Gestational age	10	0.59(0.28,0.85)	0.82	0.65(0.46,0.80)	0.69
	Risk stratification					
	High-risk groups for preterm birth	7	0.64(0.44,0.84)	0.99	0.67(0.57,0.77)	0.09
	Non-high-risk	3	0.62(0.30,0.94)		0.73(0.60,0.86)	
	Sample size					
	≥100	6	0.62(0.41,0.84)	0.76	0.74(0.66,0.82)	0.98
	<100	4	0.65(0.39,0.91)		0.59(0.46,0.73)	

ACA						
	Study design					
	Retrospective	3	0.78(0.67,0.90)	0.06	0.80(0.75,0.85)	**0.01**
	Prospective	1	0.89(0.78,0.99)		0.81(0.71,0.91)	
	Pregnancy status					
	Multiple(s)	1	0.89(0.78,0.99)	0.97	0.81(0.71,0.91)	**0.01**
	Singleton	3	0.78(0.67,0.90)		0.80(0.75,0.85)	
	Gestational age					
	second trimester	2	0.89(0.81,0.97)	0.65	0.81(0.75,0.88)	**0.00**
	first trimester	2	0.72(0.58,0.86)		0.79(0.73,0.85)	
	Risk stratification					
	High-risk groups for preterm birth	2	0.86(0.75,0.96)	0.7	0.81(0.74,0.88)	**0.00**
	Non-high-risk	2	0.79(0.65,0.92)		0.80(0.74,0.86)	
	Sample size					
	≥100	1	0.68(0.50,0.86)	**0.01**	0.78(0.71,0.86)	**0.00**

	<100	3	0.87(0.79,0.95)		0.81(0.76,0.87)	
IOS						
	Study design					
	Retrospective	4	0.56(0.40,0.71)	0.89	0.81(0.72,0.90)	**0.02**
	Prospective	4	0.51(0.35,0.68)		0.83(0.75,0.92)	**0.00**
	Pregnancy status	8	0.55(0.36,0.72)	0.98	0.79(0.64,0.88)	0.59
	Gestational age	8	0.46(0.16,0.79)	0.71	0.83(0.57,0.95)	0.91
	Risk stratification					
	High-risk groups for preterm birth	4	0.51(0.35,0.68)	0.65	0.83(0.75,0.92)	0.07
	Non-high-risk	4	0.56(0.40,0.71)		0.81(0.72,0.90)	
	Sample size					
	≥100	6	0.54(0.41,0.66)	0.88	0.82(0.75,0.89)	0.13
	<100	2	0.54(0.29,0.79)		0.83(0.70,0.96)	
EOS						
	Study design					

	Retrospective	3	0.56(0.40,0.71)	0.89	0.81(0.72,0.90)	**0.02**
	Prospective	3	0.51(0.35,0.68)		0.83(0.75,0.92).	
	Pregnancy status	6	0.55(0.36,0.72)	0.98	0.79(0.64,0.88)	0.59
	Gestational age	6	0.46(0.16,0.79)	0.71	0.83(0.57,0.95)	0.91
	Risk stratification					
	High-risk groups for preterm birth	4	0.51(0.35,0.68)	0.65	0.83(0.75,0.92)	0.07
	Non-high-risk	2	0.56(0.40,0.71)		0.81(0.72,0.90)	
	Sample size					
	≥100	3	0.48(0.35,0.61)	0.16	0.86(0.81,0.91)	0.18
	<100	3	0.64(0.48,0.79)		0.74(0.64,0.83)	
IOS/EOS ratio						
	Study design					
	Retrospective	4	0.72(0.62,0.81)	0.32	0.76(0.70,0.81)	**0.00**
	Prospective	2	0.66(0.55,0.77)		0.35(0.24,0.46)	

	Pregnancy status	6	0.66(0.56,0.75)	0.57	0.37(0.25,0.49)	**0.00**
	Gestational age	6	0.65(0.55,0.75)	0.5	0.38(0.22,0.56)	**0.01**
	Risk stratification					
	High-risk groups for preterm birth	3	0.66(0.56,0.77)	0.04	0.54(0.31,0.76)	0.14
	Non-high-risk	3	0.72(0.63,0.82)		0.74(0.57,0.91)	
	Sample size					
	≥100	4	0.71(0.62,0.79)	0.35	0.65(0.44,0.85)	0.85
	<100	2	0.67(0.53,0.81)		0.65(0.36,0.95)	
ECI						
	Study design					
	Retrospective	7	0.72(0.65,0.79)	0.84	0.68(0.58,0.79)	0.25
	Prospective	2	0.57(0.41,0.73)		0.74(0.55,0.92)	
	Pregnancy status	9	0.66(0.58,0.73)	0.45	0.58(0.45,0.70)	0.14
	Gestational age	9	0.73(0.59,0.83)	0.72	0.49(0.33,0.65)	**0.02**
	second trimester	6	0.69(0.63,0.75)	**0.02**	0.63(0.59,0.67)	**0.00**

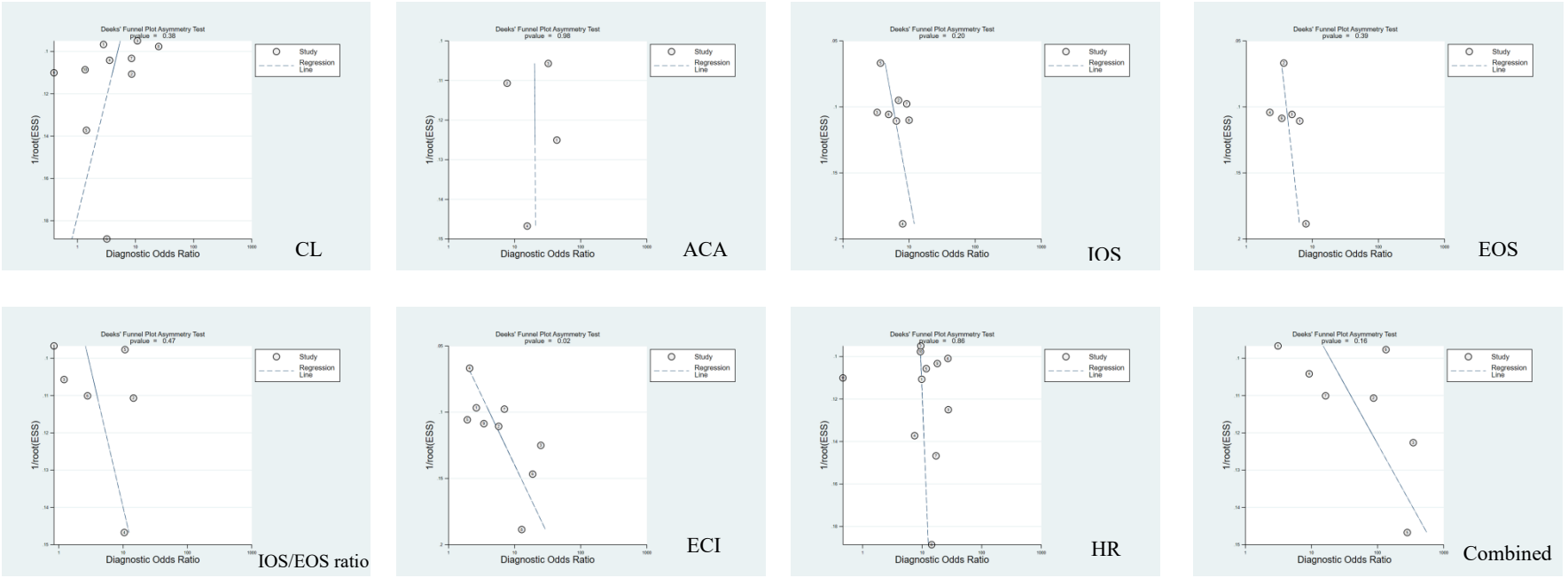
	first trimester	2	0.64(0.47,0.79)		0.83(0.76,0.88)	
	Risk stratification					
	High-risk groups for preterm birth	5	0.68(0.58,0.79)	0.06	0.70(0.57,0.83)	0.36
	Non-high-risk	4	0.72(0.62,0.82)		0.69(0.55,0.83)	
	Sample size					
	≥100	4	0.69(0.60,0.79)	0.09	0.62(0.48,0.75)	**0.02**
	<100	5	0.71(0.60,0.81)		0.75(0.65,0.85)	
HR						
	Study design					
	Retrospective	8	0.79(0.72,0.85)	0.06	0.72(0.53,0.91)	0.63
	Prospective	3	0.78(0.67,0.90)		0.79(0.53,0.88)	
	Pregnancy status	11	0.78(0.62,0.89)	0.96	0.72(0.26,0.95)	0.92
	Gestational age	11	0.79(0.68,0.87)	0.92	0.77(0.43,0.93)	0.87
	Risk stratification					
	High-risk groups for preterm	6	0.76(0.69,0.84)	**0**	0.80(0.64,0.97)	0.52

	birth					
	Non-high-risk	5	0.81(0.72,0.89)		0.65(0.39,0.91)	
	Sample size					
	≥100	5	0.80(0.71,0.88)	**0.04**	0.62(0.36,0.88)	0.15
	<100	6	0.78(0.69,0.86)		0.82(0.66,0.97)	
Combined						
	Study design					
	Retrospective	5	0.91(0.83,0.96)	0.24	0.90(0.84,0.96)	0.75
	Prospective	2	0.66(0.47,0.85)		0.75(0.57,0.92)	
	Pregnancy status	7	0.80(0.51,0.94)	0.53	0.70(0.56,0.81)	**0.01**
	Gestational age	7	0.71(0.39,0.90)	0.19	0.75(0.52,0.89)	0.19
	Risk stratification					
	High-risk groups for preterm birth	3	0.76(0.56,0.96)	0.07	0.84(0.71,0.97)	0.15
	Non-high-risk	4	0.91(0.83,1.00)		0.88(0.80,0.97)	
	Sample size					

≥100	5	0.80(0.67,0.92)	0.1	0.83(0.74,0.92)	**0.03**
<100	2	0.98(0.92,1.00)		0.93(0.86,0.97)	

Supplementary Table 4 Diagnostic Performance of E-Cervix and Conventional Parameters Calculated via Frequentist Meta-Analysis (Stata)

Parameters	AUC(95%CI)	Sensitivity(95%CI)	Specificity(95%CI)	DOR(95%CI)	LR+(95%CI)	LR−(95%CI)
CL(cm)	0.72 (0.67, 0.75)	0.63 (0.46, 0.78)	0.69 (0.60, 0.77)	4.00 (2.00, 8.00)	2.00 (1.50,2.80)	0.53 (0.34, 0.82)
ACA	0.83 (0.80, 0.86)	0.83 (0.71, 0.90)	0.80 (0.75, 0.84)	19.00 (9.00, 41.00)	4.20 (3.20, 5.50)	0.22 (0.13, 0.38)
IOS	0.76 (0.72, 0.79)	0.54 (0.42, 0.65)	0.82 (0.75,0.88)	5.00 (4.00, 7.00)	3.00 (2.40, 3.80)	0.56 (0.46, 0.69)
EOS	0.72 (0.66, 0.79)	0.56 (0.42, 0.69)	0.76 (0.65, 0.84)	4.00 (3.00, 6.00)	2.30 (1.80, 3.00)	0.58 (0.46, 0.72)
IOS/EOSratio	0.71 (0.67, 0.75)	0.70 (0.62, 0.77)	0.65 (0.47, 0.79)	4.00 (2.00, 11.00)	2.00 (1.20, 3.30)	0.47 (0.31, 0.71)
ECI	0.75 (0.71, 0.78)	0.70 (0.62, 0.77)	0.69 (0.59, 0.78)	5.00 (3.00, 10.00)	2.30 (1.60, 3.20)	0.43 (0.32, 0.58)
HR(%)	0.82 (0.78, 0.85)	0.74 (0.56, 0.86)	0.74 (0.56, 0.86)	10.00 (5.00, 20.00)	3.00 (1.70, 5.20)	0.29 (0.23, 0.37)
Combined	0.93 (0.91, 0.95)	0.87 (0.71, 0.95)	0.87 (0.77, 0.93)	43.00 (11.00, 162.00)	6.50 (3.50, 12.10)	0.15 (0.06, 0.36)



Supplementary Figure 1 Deeks funnel plot to evaluate potential publication bias.